

WHAT IS CLAIMED IS:

1. An optical signal quality monitoring apparatus comprising:
an optical coupler for performing a coupling operation for an input optical signal;
a photodetector (PD) for converting said input optical signal into an electrical
5 signal;
a clock decision recovery (CDR) unit for detecting a clock from the electrical signal
from said PD and recovering data on the basis of the detected clock; and
monitoring unit for converting an output optical signal from said optical coupler
into an electrical signal, subtracting the converted signal from a recovered data signal by
10 said CDR unit, band pass filtering the resulting difference signal, and measuring radio-
frequency power from the filtered result, said radio-frequency power being an error value
of said input optical signal.

2. The apparatus of claim 1, wherein said monitoring unit includes:
a second PD for receiving an output optical signal from said optical coupler and
15 converting the received optical signal into an electrical signal;
an inverting amplifier for amplifying the electrical signal from said second PD to
said predetermined level and inverting the amplified signal;
an adder for adding the amplified/inverted signal from said inverting amplifier to
said recovered data signal from said CDR unit to obtain said difference signal;

a band pass filter for performing a band pass filtering operation of passing an output signal from said adder at a predetermined band; and
a radio-frequency power detector for measuring said radio-frequency power from an output signal from said band pass filter.

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3. The apparatus of claim 2, further comprising a processor, communicatively connected to the radio-frequency power detector, having a display screen for notifying a user of said error value.

10 4. The apparatus of claim 2, further comprising a processor, communicatively connected to the radio-frequency power detector, having storage for logging said error value.

15 5. The apparatus of claim 2, further comprising a processor, communicatively connected to the radio-frequency power detector, configured for determining a source of said error value.

20 6. An optical signal quality monitoring apparatus comprising:
a PD for converting an input optical signal into an electrical signal;
a CDR unit for detecting a clock from the electrical signal from said PD and recovering data on the basis of the detected clock; and

monitoring unit for inverting/amplifying the electrical signal from said PD to a predetermined level, synthesizing the inverted/amplified signal with a recovered data signal from said CDR unit to obtain a difference between said inverted/amplified signal and said recovered data signal, band pass filtering the resulting difference signal and measuring 5 radio-frequency power from the filtered result, said radio-frequency power being an error value of said input optical signal.

7. The apparatus of claim 6, wherein said monitoring unit includes:

an inverting amplifier for amplifying the electrical signal from said PD to said predetermined level and inverting the amplified signal;

10 an adder for adding the amplified/inverted signal from said inverting amplifier to said recovered data signal from said CDR unit to obtain said difference signal;

a band pass filter for performing a band pass filtering operation of passing an output signal from said adder at a predetermined band; and

15 a radio-frequency power detector for measuring said radio-frequency power from an output signal from said band pass filter.

8. The apparatus of claim 7, further comprising a processor, communicatively connected to the radio-frequency power detector, having a display screen for notifying a user of said error value.

9. The apparatus of claim 7, further comprising a processor, communicatively connected to the radio-frequency power detector, having storage for logging said error value.

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10. The apparatus of claim 7, further comprising a processor, communicatively connected to the radio-frequency power detector, configured for determining a source of said error value.

11. An optical signal quality monitoring apparatus comprising:

10 an optical coupler for performing a coupling operation for an input optical signal;
 a PD for converting said input optical signal into an electrical signal;
 a CDR unit for detecting a clock from the electrical signal from said PD and recovering data on the basis of the detected clock; and
 monitoring unit for converting an output optical signal from said optical coupler
15 into an electrical signal, inverting/amplifying the converted electrical signal to a predetermined level, band pass filtering the inverted/amplified signal and a recovered data signal from said CDR unit, respectively, synthesizing the filtered results to obtain a difference between the filtered inverted/amplified signal and the filtered recovered data signal, and measuring radio-frequency power from the resulting difference signal, said
20 radio-frequency power being an error value of said input optical signal.

12. The apparatus of claim 11, wherein said monitoring unit includes:

a second PD for receiving the output optical signal from said optical coupler and
converting the received optical signal into an electrical signal;

an inverting amplifier for amplifying the electrical signal from said second PD to
5 said predetermined level and inverting the amplified signal;

a first band pass filter for performing a band pass filtering operation of passing an
output signal from said inverting amplifier at a predetermined band;

a second band pass filter for performing a band pass filtering operation of passing
said recovered data signal from said CDR unit at said predetermined band;

10 an adder for synthesizing output signals from said first and second band pass filters
to obtain said difference signal; and

a radio-frequency power detector for measuring said radio-frequency power from an
output signal from said adder.

15 13. The apparatus of claim 12, further comprising a processor, communicatively
connected to the radio-frequency power detector, having a display screen for notifying a
user of said error value.

20 14. The apparatus of claim 12, further comprising a processor, communicatively
connected to the radio-frequency power detector, having storage for logging said error

value.

15. The apparatus of claim 12, further comprising a processor, communicatively connected to the radio-frequency power detector, configured for determining a source of said error value.

5 16. An optical signal quality monitoring apparatus comprising:
 a PD for converting an input optical signal into an electrical signal;
 a CDR unit for detecting a clock from the electrical signal from said PD and recovering data on the basis of the detected clock; and
 monitoring unit for inverting/amplifying the electrical signal from said PD to a
10 predetermined level, band pass filtering the inverted/amplified signal and a recovered data signal from said CDR unit, respectively, synthesizing the filtered results to obtain a difference between the filtered inverted/amplified signal and the filtered recovered data signal, and measuring radio-frequency power from the resulting difference signal, said radio-frequency power being an error value of said input optical signal.

15 17. The apparatus of claim 16, wherein said monitoring unit includes:
 an inverting amplifier for amplifying the electrical signal from said PD to said predetermined level and inverting the amplified signal;
 a first band pass filter for performing a band pass filtering operation of passing an output signal from said inverting amplifier at a predetermined band;

a second band pass filter for performing a band pass filtering operation of passing said recovered data signal from said CDR unit at said predetermined band;

an adder for synthesizing output signals from said first and second band pass filters to obtain said difference signal; and

5 a radio-frequency power detector for measuring said radio-frequency power from an output signal from said adder.

18. The apparatus of claim 17, further comprising a processor, communicatively connected to the radio-frequency power detector, having a display screen for notifying a
10 user of said error value.

19. The apparatus of claim 17, further comprising a processor, communicatively connected to the radio-frequency power detector, having storage for logging said error value.

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20. The apparatus of claim 17, further comprising a processor, communicatively connected to the radio-frequency power detector, configured for determining a source of said error value.